1 USN Training Center
2 Martin Company
3 Coca Cola Company
4 Habitat Apartments
5 Florida Hospital
6 Park Plaza Hotal
7 Frito Lay, Inc.
8 Royal Crown Cola
9 Orange Memorial Hospital
10 Sheraton Olympic Hotel

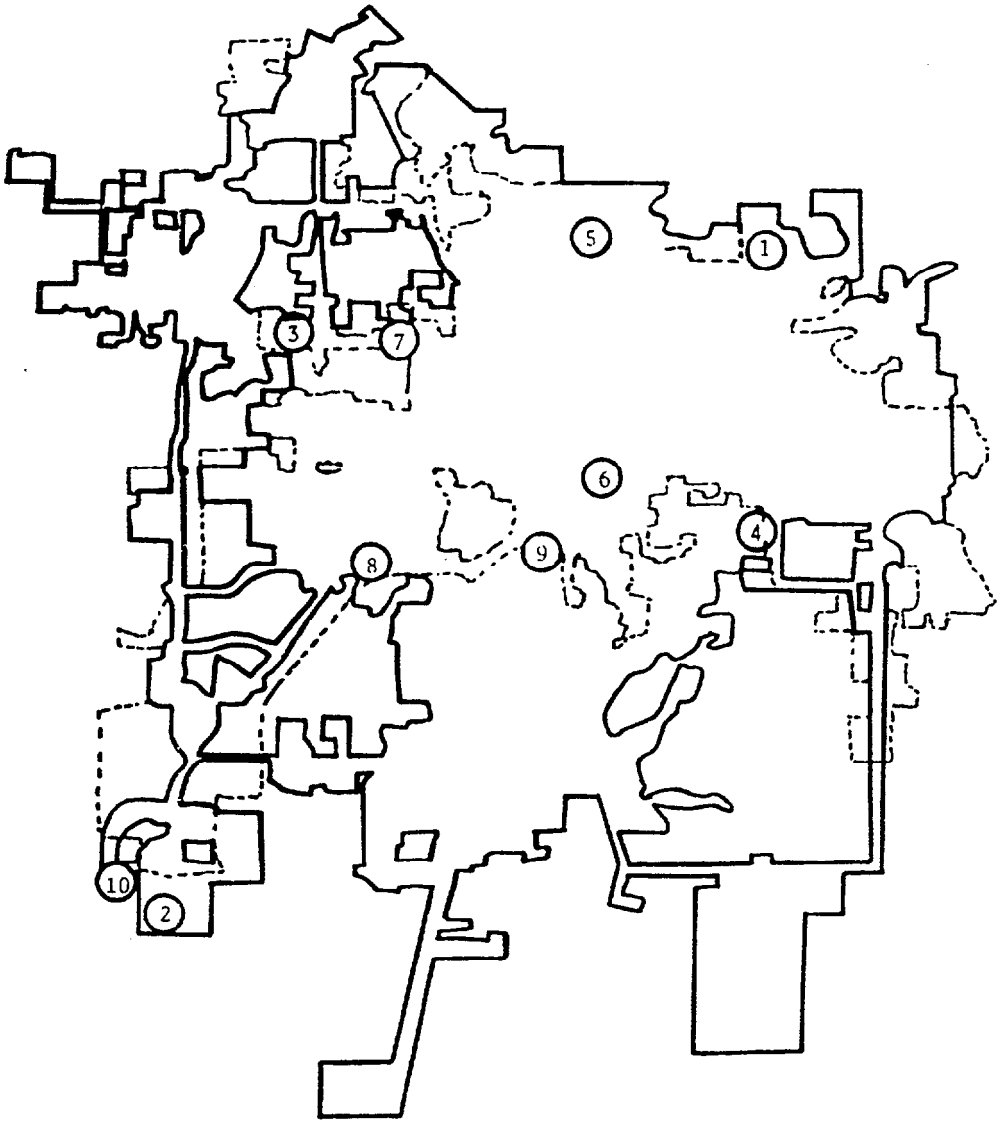

Figure 62. Orlando Water Utility major users.

The average unit costs for all water supplied during the most recent year studied are given as follows:

	$/mil gal
Support services	110
Acquisition	42
Treatment	22
Distribution	135
Interest	85
Total	394

SECTION 14

ELIZABETHTOWN WATER COMPANY

The Elizabethtown Water Company provides treated water to areas in five counties of New Jersey, with a combined population of 1.8 million--Union, Middlesex, Summerset, Mercer, and Hunterdon. The retail service area of the Elizabethtown Water Company includes a relatively stable population of 507,836 as of 1974. The amount of water consumed increased by 30% over the 10-year period of the study, primarily as a result of integrating smaller utilities.

As an investor-owned utility, the Elizabethtown Water Company has some different characteristics from the majority of utilities studied; for example, unlike publicly owned utilities, an investor-owned utility incurs liability for real estate taxes. Tables 120 and 121 show some basic system facts.

WATER SUPPLY SERVICE AREA

The Elizabethtown Water Company provides water on a wholesale and retail basis to all classes of customers within the service area (Figure 63). The service area includes irregularly shaped portions of the five counties listed above. In addition, treated water is sold on a wholesale basis to York, Elizabeth, and other cities, and to other water companies such as Commonwealth Water Company and Middlesex Water Company. Service to these large customers is provided through master meters.

Limited amounts of treated water are purchased from other utilities, primarily the Newark Utility, located at the northeast end of the company's operating area.

ORGANIZATION

The Elizabethtown Water Company is controlled by a board of directors headed by a chairman to whom the president of the company reports. As shown in Figure 64, the president has four organizational areas reporting to him--operations, controller, business, and legal. The largest area, operations, includes engineering, planning, and the physical operations and maintenance of the entire utility. The controller's area is responsible for all financial documentation and accounting of the activities as well as meter reading, billing, and collecting. The business area handles purchasing, contracting, and personnel records.

TABLE 120. ELIZABETHTOWN WATER COMPANY, BASIC FACTS (1974)

Item	Amount
Population:	
SMSA	N.A.
County (Union, Middlesex, Summerset, Mercer, Hunterdon)	1,800,000
Retail service area	507,836
Area of retail service area (sq miles)	440
Recognized customer classes (no. of meters by meter size shown in Table 121)	
Percent metered	100
Purchased water (mil gal)	
Treated	95
Raw	32,597
Source water:	
Surface (%)	77
Wells (%)	23
Pipe in system (miles)	1,790
Elevation of treatment plants (ft above mean sea level):	
Somerville	60
Raritan-Millstone	40
Pottersville	460
Stony Brook	98
Harrison Station	65
Elevation of service area (min-max ft)	0 - 560
Revenue producing water (mil gal)	38,235
Treated water (pumpage from treatment plants + treated purchased water, mil gal)	43,886
Maximum day/maximum hour (MGD)	157/226

TABLE 121. ELIZABETHTOWN WATER COMPANY NUMBER OF METERS BY METER SIZE

Meter size (in.)	No. of meters
5/8	117,007
3/4	3,621
1	2,521
1½	1,073
2	1,204
3	338
4	465
6	708
8	201
10	25
12	4
16	1
20	1

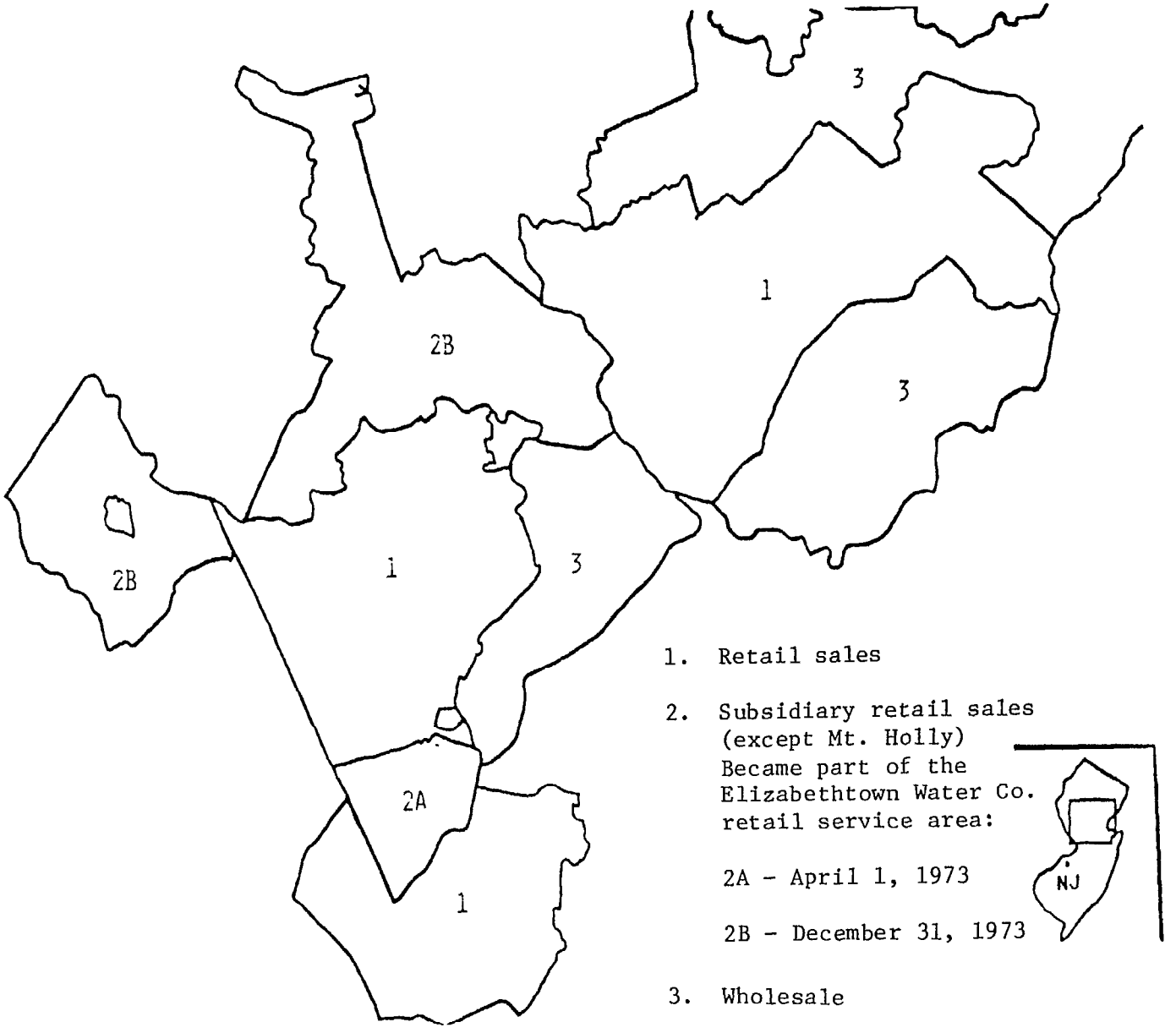

Figure 63. Elizabethtown Water Company service area map.

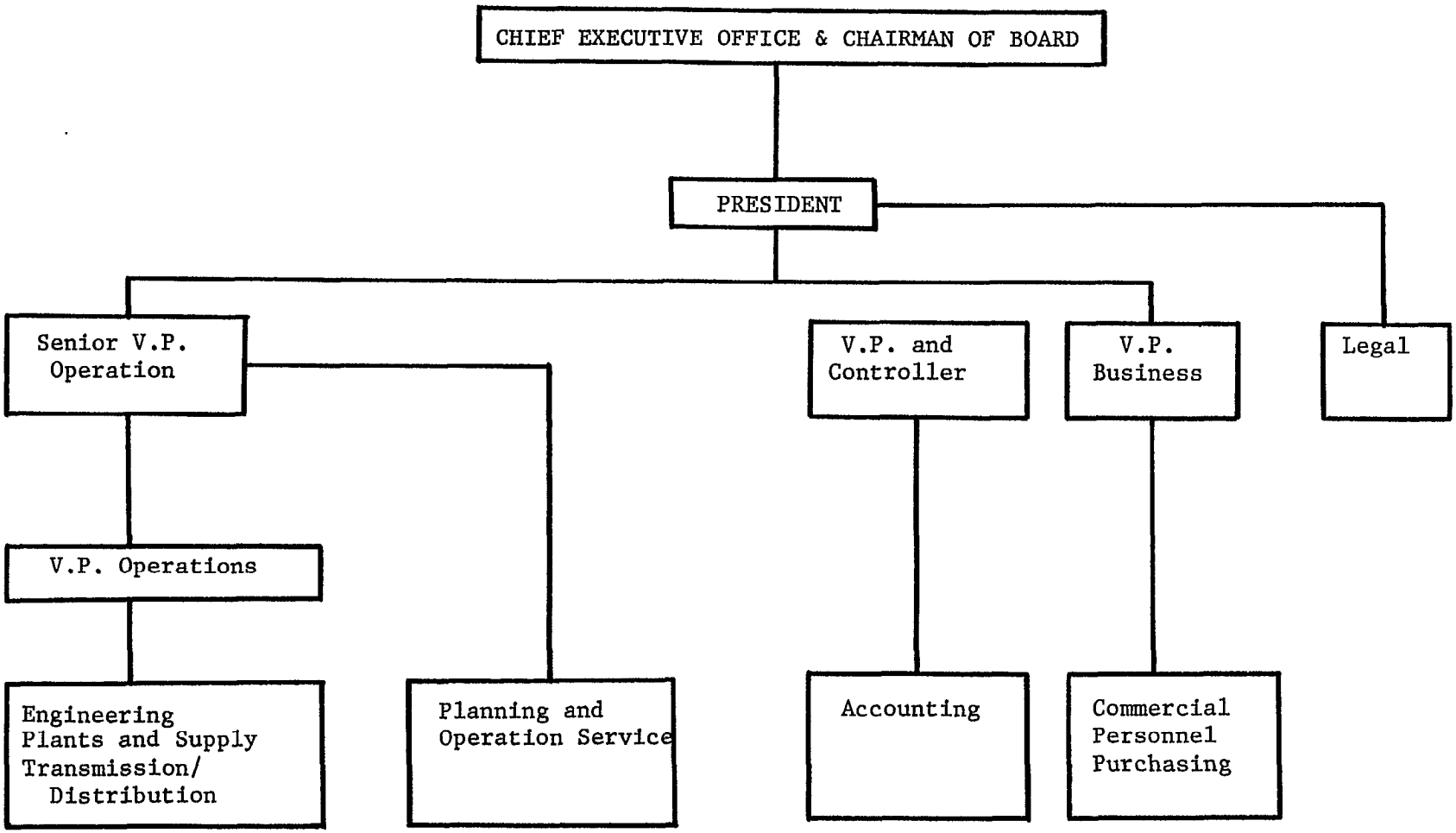

Figure 64. Elizabethtown Water Company organizational chart.

ACQUISITION

Raw water comes from both surface and ground sources--approximately 77% surface and 23% ground. Payments made to the State of New Jersey for surface water are designed to cover the proportional share of the cost for operating and financing the Spruce Run and Round River reservoirs, which are the primary sources of water. The company has grants to obtain 70 MGD from the Raritan River Basin, with an option to go up to 110 MGD to meet peaks in demand. Other grants permit withdrawal of 28 MGD from the Delaware River via the Delaware and Raritan Canal and nearly three MGD from the Raritan River. In addition to this surface water, the company obtains another 40 MGD from wells located at various points throughout the service area. The surface water is processed through four treatment plants that purify the water and deliver it to the distribution system. Additional water is added in the distribution system from well fields located at various points within the distribution system. The well water is chlorinated and moved directly into the distribution system along with the water from the treatment facilities.

TREATMENT

Raw surface water is treated at four facilities: Harrison Street Station, Raritan Millstone Filter Plant (Figure 65), Somerville Filter Plant, and Potterville Plant. At one time, these facilities were part of independent utility systems that were brought together to form the Elizabethtown Water Company. The facilities were constructed at different times and provide water to different zones of the service area. Each facility has an intake at a river or canal that flows by or near the filter plant. The plants are similar in operation and have coagulation basins for sedimentation and flocculation.

At times, taste and odor problems have occurred as a result of winter thaws followed by heavy rainstorms. In such situations, the run-off into the watershed contains road tars, oil, salt, fertilizer, etc. These instances are predictable, and the facility treatment process is capable of making the water supply entirely safe to drink despite its potability. There are times, however, when such water has a medical or chemical taste or odor. This is a recurring problem, and some progress has been made in overcoming it. The technology of the industry has not reached the state where taste and odor problems can be completely eliminated.

The main treatment plant, Raritan Millstone, has a capacity of 160 MGD. The other three plants are significantly smaller, with the Somerville filter plant having a capacity of 8.0 MGD, Stoneybrook plant, 6.0 MGD, and Potterville plant, 0.5 MGD. This gives a combined surface water treatment capability of 174.5 MGD.

Chlorination is accomplished at all well sites, and one well site where there are eight wells operates a 2.0 MGD treatment facility for iron removal.

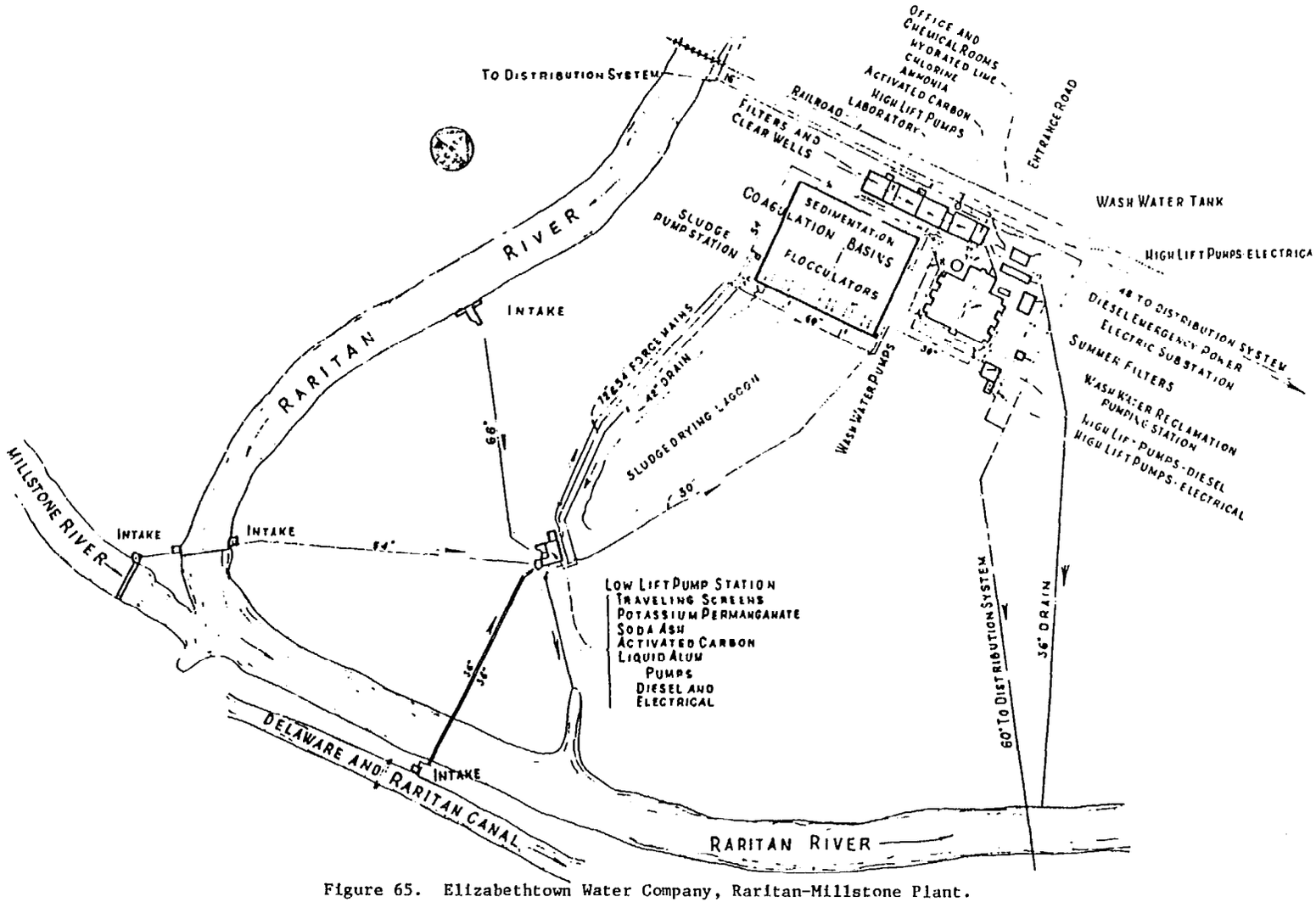

Figure 65. Elizabethtown Water Company, Raritan-Millstone Plant.

TRANSMISSION AND DISTRIBUTION

The transmission and distribution system is relatively complex. Thirty-nine well fields consisting of approximately 100 wells each inject water into the system at various points. In addition, 30 booster stations operate one to six pumps each. Also intermixed in the distribution system are seven storage reservoirs with a combined capacity of 14.2 mil gal, one clear well with a 0.1-mil gal capacity, 17 storage tanks with a combined capacity of 38.9 mil gal, and seven standpipes with a combined capacity of 4.1 mil gal. Table 122 provides information on the system's storage.

The transmission and distribution system consists of approximately 1,790 miles of underground pipe ranging from 60 in. in diameter at the main treatment facility to the 2-in. pipe used in portions of the system. Transmission of large amounts of water throughout the entire system is somewhat reduced by the location of the wells.

COST ANALYSIS

Growth in consumer demand for water from 1964 through 1974 is shown in Figure 66.

Using the standard cost categories, data were collected and reported as shown in Tables 123, 124, and 125. As indicated by the relative increase in the support services category, a major portion of the operating budget was expended for labor. Table 126 examines labor costs of operations and maintenance activities related to producing water. As shown, the cost/man-hour increased by 73%, whereas the total payroll hours required to produce 1 mil gal of RPW decreased by 10%. This means that the operating costs for producing water did not increace as rapidly as the labor costs/man-hour. When it is no longer possible to gain increasing efficiency with respect to manpower, the payroll cost will start to increase at least at the same rate as labor cost.

Table 127 summarizes the operating, depreciation, and interest expenses for the 10-year period. Table 128 computes the capital and operating expenditure ratios. Operating expenses are shown as a total of the values in Table 123, which represent expenses incurred in the norman day-to-day operation of the system. The capital expenses are the total of periodic expenditures to provide major equipment and facilities plus the interest charged on money borrowed for these purposes.

A comparison of the operating and capital expenses as a percent of total (Table 127) shows more expenses associated with operations than with capital. Over the 10-year period, the trend remained in favor of operation; however, the ratio has shifted somewhat toward capital. In 1965, the ratio was approximately 76% operating expense to 24% capital expense. In 1974, the ratio had changed to the point that only 69% was expended for operations, and 31% was expended for capital.

TABLE 122. ELIZABETHTOWN WATER COMPANY STORAGE FACILITIES

Type of storage	Ground elevation (ft)	Overflow Elevation (ft)	Capacity (mil gal)
Storage reservoirs:			
Netherwood	120	133	0.5
Netherwood	120	133	1.0
Jerusalem	243	264	9.4
Springfield	106	116	1.0
Hummocks	61	71	1.0
Stony Brook	---	---	0.3
Harrison St.	---	---	1.0
Collecting reservoir:			
Pottersville	---	488	6.5
Clear well:			
Pottersville	---	---	0.1
Tanks:			
Oak Tree	156	216	10.0
Oak Tree	156	216	10.0
Johnson Drive	239	264	0.8
Johnson Drive	487	579	0.5
Michigan Ave.	171	276	2.0
Coles Ave.	515	560	0.2
Jerusalem	265	365	1.5
Warren Twp.	575	639	0.5
Hi Thor	540	645	0.4
Hummocks	72	283	0.3
Montgomery	153	273	1.0
Mtnside	545	633	0.4
John St.	200	319	0.6
Terhune	222	319	0.6
Salzman	311	400	0.1
Oak Tree	160	216	5.0
Hummocks	40	95	5.0
Standpipes:			
Drakes Corner	397	437	0.1
Raritan	56	206	0.6
Bridgewater	168	264	0.4
Branchburg	223	319	1.0
Washington Valley	635	711	1.0
Oak Tree	156	252	0.9
Drakes Corner	397	437	0.1

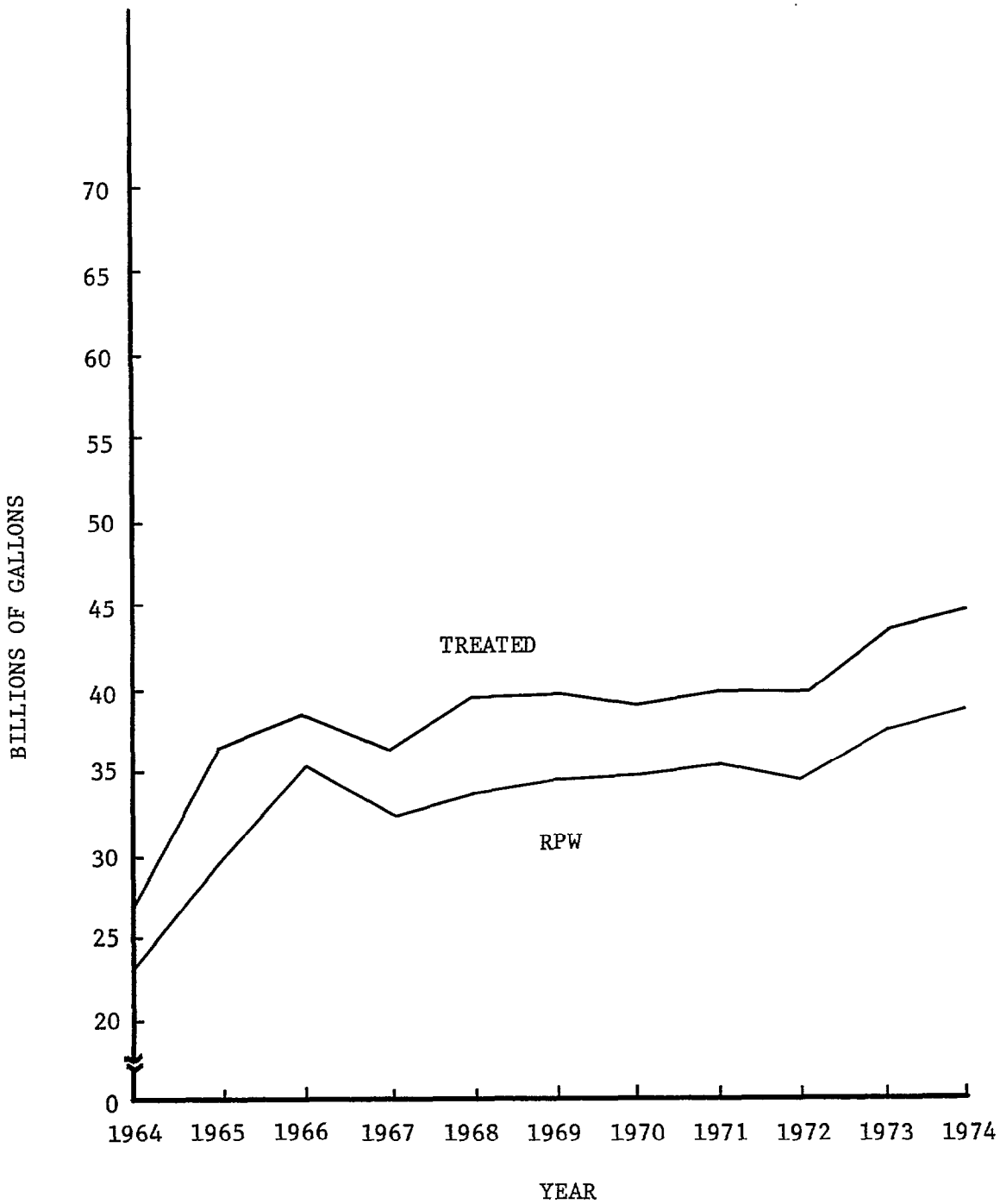

Figure 66. Elizabethtown Water Company water flow: treated water versus RPW.

TABLE 123. ELIZABETHTOWN WATER COMPANY ANNUAL OPERATING COSTS

Category	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Support services:										
Administration	$820,203	939,772	$990,793	$1,050,742	$1,275,119	$1,509,030	$1,664,239	$1,693,288	$1,977,604	$2,138,306
Accounting and collection	371,476	365,564	401,178	448,651	491,310	598,985	612,352	658,040	699,221	889,422
Total support services	1,191,679	1,305,336	1,391,971	1,449,393	1,766,429	2,108,015	2,276,591	2,351,328	2,676,825	3,027,728
Acquisition:										
Operating	8,483	7,407	7,680	10,479	6,658	7,046	5,139	5,134	5,278	8,329
Purchased water	447,048	704,860	928,782	958,190	1,026,094	1,085,668	1,129,825	1,444,576	1,441,516	1,442,434
Maintenance	29,332	35,971	42,918	79,631	60,033	82,502	91,033	42,685	31,394	50,760
Total acquisition	484,863	748,238	979,380	1,048,300	1,092,785	1,175,216	1,225,997	1,492,395	1,478,188	1,501,523
Treatment:										
Operating	109,723	110,123	129,198	110,497	108,164	118,694	145,918	189,167	177,853	373,034
Chemicals	294,027	389,575	258,805	354,328	400,771	380,955	432,830	426,643	490,264	603,167
Maintenance	43,852	64,879	24,466	53,681	70,295	93,810	112,424	109,094	121,440	139,305
Total treatment	447,602	564,577	412,469	518,506	579,230	593,459	691,172	724,904	789,557	1,115,506
Power and pumping:										
Operating	236,619	234,696	264,624	287,392	286,089	272,731	317,638	232,290	376,934	327,343
Fuel and power	667,728	784,544	723,653	756,166	820,809	797,880	1,045,675	1,066,204	1,272,486	2,198,957
Maintenance	59,833	60,217	54,292	60,843	54,476	60,905	45,016	113,969	169,414	184,113
Total power and pumping	964,180	1,079,447	1,042,569	1,104,401	1,161,374	1,131,516	1,408,329	1,412,463	1,818,834	2,710,413
Transmission and distribution:										
Operating	388,579	444,813	495,101	599,825	665,548	719,317	801,718	739,116	745,037	930,208
Maintenance	230,458	198,974	207,403	212,965	213,672	198,979	215,457	280,459	323,877	363,784
Total transmission and distr.	619,037	643,787	702,504	812,790	879,220	918,296	1,017,175	1,019,575	1,068,914	1,293,992
Total	3,707,361	4,341,385	4,528,893	4,983,390	5,479,038	5,926,502	6,619,264	7,000,665	7,832,318	9,649,162

TABLE 124. ELIZABETHTOWN WATER COMPANY UNIT OPERATING COSTS ($/mil gal RPW)

Category	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Support services:										
Administration	$27.95	$27.19	$31.24	$31.61	$37.66	$43.85	$47.79	$49.38	$54.07	$55.92
Accounting and collection	12.66	10.58	12.65	13.50	14.51	17.41	17.59	19.19	19.12	23.26
Total support services	40.61	37.77	43.89	45.11	52.17	61.26	65.38	68.57	73.19	79.18
Acquisition:										
Operating	0.29	0.21	0.24	0.32	0.20	0.20	0.15	0.15	0.14	0.22
Purchased water	15.23	20.39	29.29	28.83	30.30	31.55	32.45	42.13	39.42	37.73
Maintenance	1.00	1.04	1.35	2.40	1.77	2.40	2.61	1.24	0.86	1.33
Total acquisition	16.52	21.64	30.88	31.55	32.27	34.15	35.21	43.52	40.42	39.28
Treatment:										
Operating	3.74	3.19	4.07	3.32	3.19	3.45	4.19	5.52	4.86	9.76
Chemicals	10.02	11.27	8.16	10.66	11.84	11.07	12.43	12.44	13.41	15.78
Maintenance	1.49	1.88	0.77	1.62	2.08	2.73	3.23	3.18	3.32	3.64
Total treatment	15.25	16.34	13.00	15.60	17.11	17.25	19.85	21.14	21.59	29.18
Power and pumping:										
Operating	8.06	6.79	8.34	8.65	8.45	7.93	9.12	6.77	10.31	8.56
Fuel and power	22.75	22.70	22.82	22.75	24.24	23.19	30.03	31.09	34.79	57.51
Maintenance	2.04	1.74	1.71	1.83	1.61	1.77	1.29	3.32	4.63	4.82
Total power and pumping	32.85	31.23	32.87	33.23	34.30	32.89	40.44	41.18	49.73	70.89
Transmission and distribution:										
Operating	13.24	12.87	15.61	18.05	19.65	20.90	23.02	21.55	20.37	24.33
Maintenance	7.85	5.76	6.54	6.41	6.31	5.78	6.19	8.18	8.86	9.51
Total transmission and distribution	21.09	18.63	22.15	24.46	25.96	26.68	29.21	29.73	29.23	33.84
Total operating cost	126.32	125.61	142.79	149.95	161.81	172.23	190.09	204.14	214.16	252.37

TABLE 125. ELIZABETHTOWN WATER COMPANY OPERATING COST CATEGORIES AS PERCENT OF TOTAL OPERATING COST

Category	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Support services:										
Administration	22.13	21.65	21.88	21.08	23.27	25.46	25.14	24.19	25.25	22.16
Accounting and collection	10.02	8.42	8.86	9.00	8.97	10.11	9.25	9.40	8.93	9.22
Total support services	32.15	30.07	30.74	30.08	32.24	35.57	34.39	33.59	34.18	31.38
Acquisition:										
Operating	0.23	0.17	0.17	0.21	0.12	0.12	0.08	0.07	0.07	0.09
Purchased water	12.06	16.23	20.51	19.24	18.73	18.32	17.07	20.64	18.41	14.94
Maintenance	0.79	0.83	0.95	1.60	1.09	1.39	1.37	0.61	0.40	0.53
Total acquisition	13.08	17.23	21.63	21.05	19.94	19.83	18.52	21.32	18.88	15.56
Treatment:										
Operating	2.96	2.54	2.85	2.21	1.97	2.00	2.20	2.70	2.27	3.87
Chemicals	7.93	8.97	5.71	7.11	7.32	6.43	6.54	6.09	6.26	6.25
Maintenance	1.18	1.50	0.54	1.08	1.29	1.59	1.70	1.56	1.55	1.44
Total treatment	12.07	13.01	9.10	10.40	10.58	10.02	10.44	10.35	10.08	11.56
Power and pumping										
Operating	6.38	5.41	5.84	5.77	5.22	4.60	4.80	3.32	4.81	3.39
Fuel and power	18.01	18.06	15.98	15.17	14.99	13.46	15.80	15.23	16.24	22.79
Maintenance	1.61	1.39	1.20	1.22	0.99	1.03	0.68	1.63	2.16	1.91
Total power and pumping	26.00	24.86	23.02	22.16	21.20	19.09	21.28	20.18	23.21	28.09
Transmission and distribution:										
Operating	10.49	10.24	10.93	12.04	12.14	12.13	12.11	10.55	9.51	9.64
Maintenance	6.21	4.59	4.58	4.27	3.90	3.36	3.26	4.01	4.14	3.77
Total transmission and distribution	16.70	14.83	15.51	16.31	16.04	15.49	15.37	14.56	13.65	13.41
Total operating expense	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

TABEL 126. ELIZABETHTOWN WATER COMPANY LABOR COST ANALYSIS

Item	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Total payroll ($)	1,587,811	1,654,576	1,722,878	1,846,771	2,063,137	2,158,699	2,421,262	2,492,084	2,720,899	3,206,656
Total hours on payroll*	430,560	501,28	486,720	488,800	465,920	476,320	468,000	461,760	480,480	503,360
Revenue-producing water (mil gal)	29,349	34,565	31,711	33,236	33,862	34,410	34,822	34,291	36,572	38,235
Total payroll/mil gal ($)	54.10	47.87	54.33	58.24	60.93	62.73	69.53	72.67	74.40	83.87
Total hours/mil gal	14.67	14.50	15.35	15.41	13.76	13.84	13.44	13.47	13.14	13.16
Average cost/man-hour ($)	3.69	3.30	3.54	3.78	4.43	4.53	5.17	5.40	5.66	6.37

* Calculated (2080 x average number of employees).

TABLE 127. ELIZABETHTOWN WATER COMPANY CAPITAL AND OPERATING COSTS

Item	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Operating expense	$3,707,361	$4,341,385	$4,528,893	$4,983,390	$5,479,038	$5,926,502	$6,619,264	$7,000,665	$7,832,318	$9,649,165
Depreciation	915,402	1,004,132	1,078,670	1,145,037	1,199,771	1,296,594	1,351,526	1,418,022	1,520,845	1,692,842
Other:										
Interest	1,039,159	1,344,648	1,577,222	1,872,357	2,058,123	2,926,501	2,819,429	2,907,539	3,373,375	4,326,732
Taxes	2,646,337	2,658,194	2,323,726	2,558,779	3,561,304	3,391,773	3,210,237	3,030,096	4,616,579	3,935,124
Total capital and operating cost	8,308,259	9,348,359	9,508,511	10,559,563	12,748,236	13,541,370	14,000,456	14,356,322	17,343,117	19,603,863
Total cost/mil gal RPW	283.08	270.45	299.85	317.71	376.48	393.53	402.05	418.66	474.21	512.71

TABLE 128. ELIZABETHTOWN WATER COMPANY CAPITAL VERSUS OPERATING EXPENSE RATIOS

Item	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Operating expenses ($)	6,353,698	6,999,579	6,852,619	7,542,169	9,040,342	9,318,275	9,829,501	10,030,761	12,448,897	13,584,289
Taxes	(2,646,337)	(2,658,194)	(2,323,726)	(2,558,779)	(3,561,304)	(3,391,733)	(3,210,237)	(3,030,096)	(4,616,579)	(3,935,124)
Capital expenses ($)	1,954,561	2,348,780	2,655,892	3,017,394	3,707,894	4,223,095	4,170,955	4,325,561	4,894,220	6,019,574
Total expense ($)	8,308,259	9,348,359	9,508,511	10,559,563	12,748,236	13,541,370	14,000,456	14,356,322	17,343,117	19,603,863
Operating expense as % of total	76.47	74.87	72.07	71.43	70.91	68.81	70.29	69.87	71,78	69.29
Capital expense as % of total	23.53	25.13	27.93	28.57	29.09	31.19	29.70	30.13	28.22	30.71

The Elizabethtown system is relatively old; therefore, the capital depreciated was expended when costs were significantly lower than at present. On the other hand, the operating expense is in current dollars. This ratio will change whenever capital investments are made by the utility, and the change will generally be proportional to the significance of the investment. For example, if a new treatment facility is added, the ratio of capital to operating expense will significantly increase because of the impact of the depreciated capital of the new investment.

SYSTEM COSTS

Examination of the costs on a functional basis is only part of the total cost picture. Because the purpose of a water supply utility is to deliver water to a consumer, it is important to be able to present costs as they relate water delivery to a demand point within the distribution system. For this reason, the functional categories, both operating and capital, will be reaggrcgated and assigned to physical components in the delivery system. This section contains such an analysis of the water supply system's cost.

Locations of the Elizabethtown Water Company facilities are shows in Figure 67. Because the locations of the 39 well fields and the 30 booster stations make it extremely difficult to identify a specific flow pattern, no arrows are drawn to show the general flow of water. Careful examination must be made of the figure to determine the locations of the wells and booster stations. Booster stations and wells are too numerous to list.

To analyze the Elizabethtown utility on a physical functions basis, it is necessary to make some basic assumptions. Costs associated with individual wells and booster stations are generally available from the utility and can be identified to the level of the function. Also, the water company, in general terms, operates four independent systems rather than one joint system with four treatment plants; well fields can be identified as located in the general distribution area of a specific treatment plant. Booster facilities and their costs can also be identified in general terms to be associated with water from specific well fields or from specific treatment plants.

Determining whether water has been boosted once, twice, three times, or more is extremely difficult, however. For the purpose of this analysis, all water that has been boosted, regardless of the number of times, is placed in one category, and all water that has not been boosted except as it was pumped from the treatment plant or from the wells is considered in another category. Based on this assumption, and lumping all costs of boosting into a single booster category, it is possible to analyze the system.

Figure 68 is a simplified schematic representation of this complicated system, using the assumption outlined above. By using one of the systems as an example, the figure is better understood. System S_1 is the Raritan Mill-stone filter plant. The first block shows the cost of the river source as $59.52/mil gal; moving down to the next block, treatment is shown as $42.07/ mil gal; then $39.4 4/mil gal is added to pump the treated water from the treatment facility into the transmission and distribution system. Water

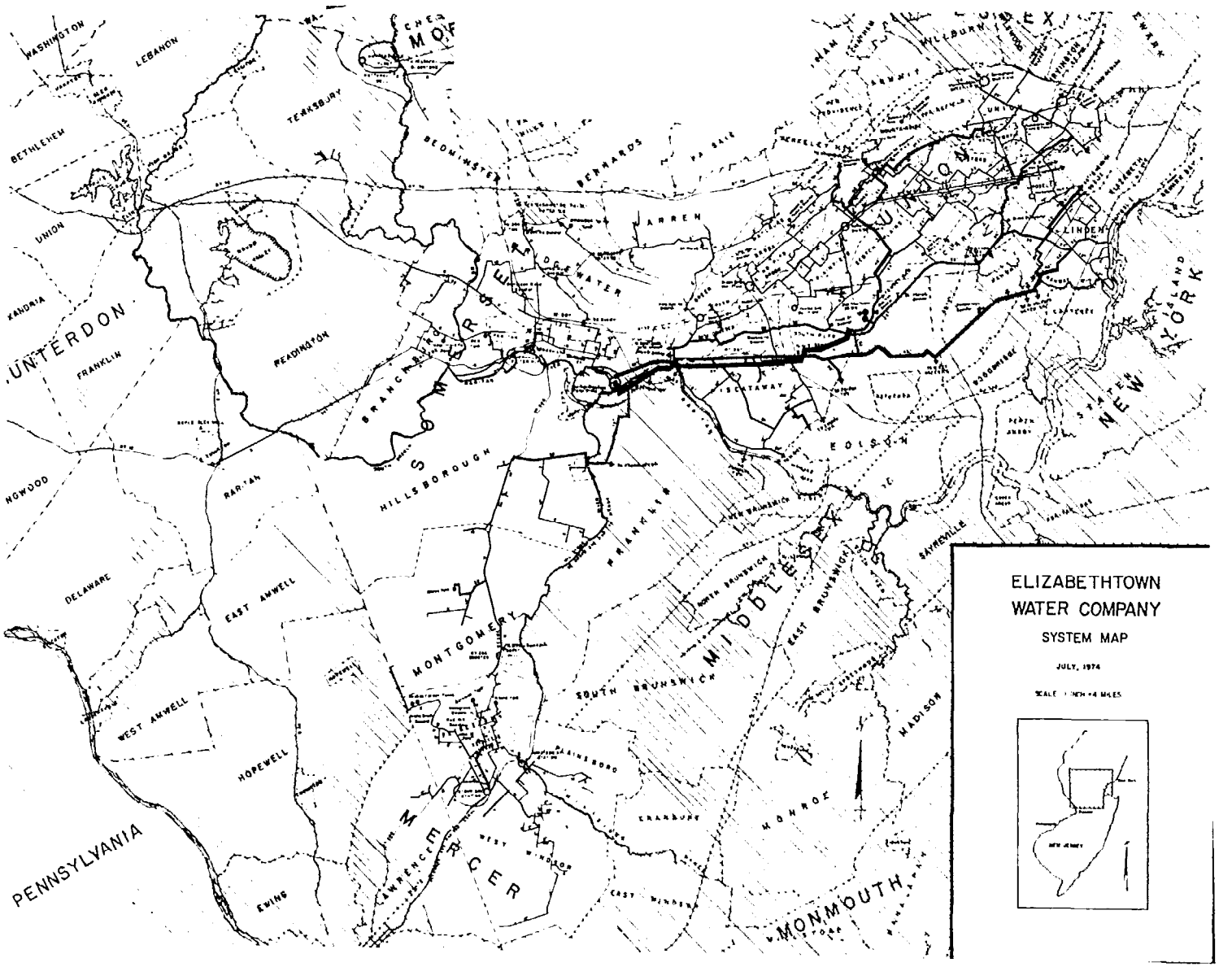

Figure 67. Elizabethtown Water Company system map, July, 1974.

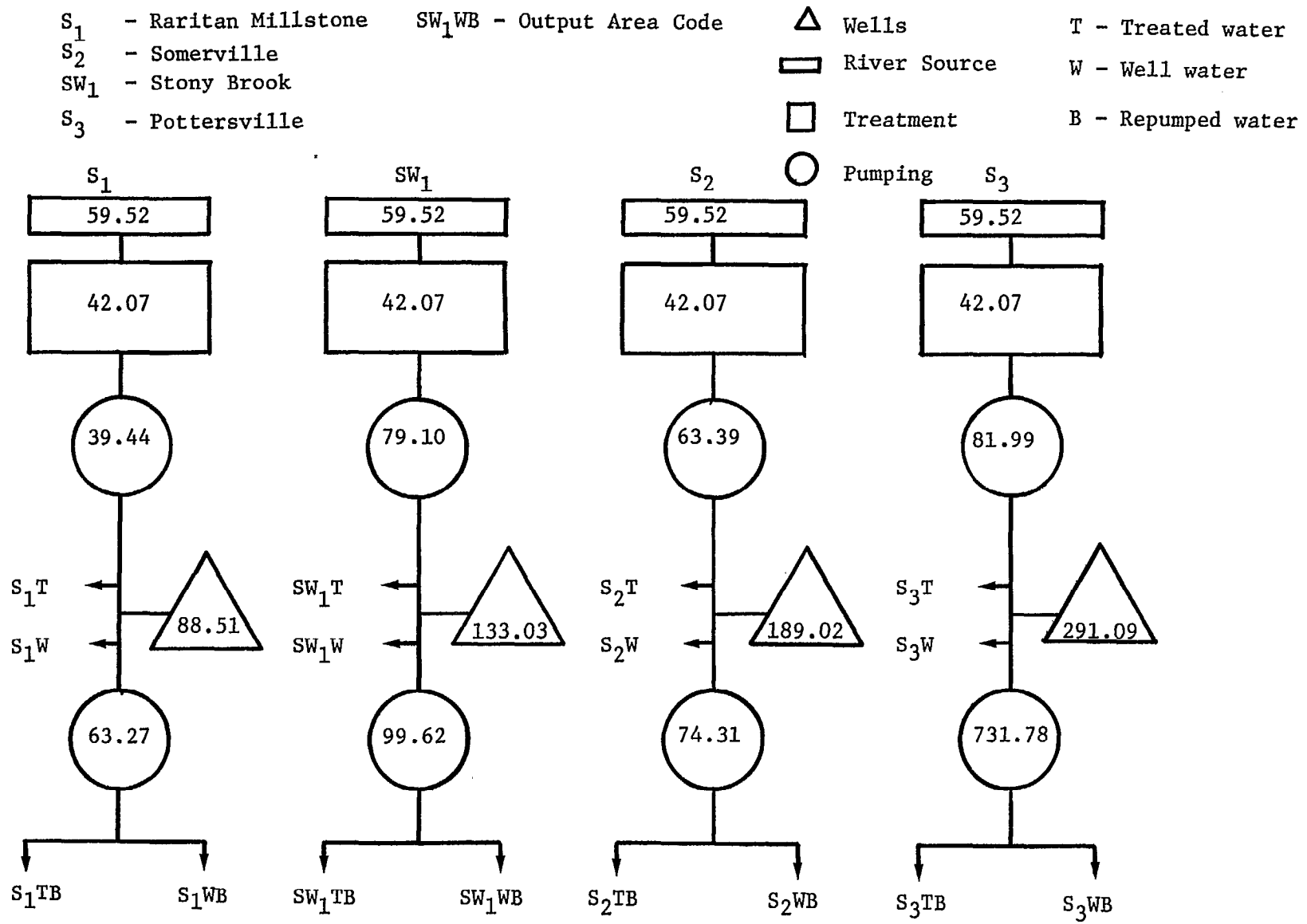

Figure 68. Elizabethtown Water Company allocation of capital and operating costs to system components ($/RPW).

from the S_1 system is then distributed to some of the consumers without further activity. This water, indicated as S_1T, is water that has been treated, pumped from the treatment plant, and distributed to customers without being boosted.

Another type of water distributed to customers in the same pressure level will be obtained from wells. The triangle to the right shows that water coming from wells in that area costs $88.51/mil gal. A portion of the water from the wells is distributed directly to the customers without further pumping. This water is identified as S_1W. Part of the water supplied by the treatment plant and the wells passes on through that distribution area and is boosted by pumps into another pressure zone.

As discussed above, it is impossible to determine the specific flow of water and therefore the number of times some water is boosted. Therefore, all costs associated with boosted water in this system are aggregated into one value, and the costs for boosting water within the system are determined. As shown, this cost is $63.27/mil gal. A portion of the well water and a portion of the treated water are boosted, and the water is distributed into other pressure zones. The water boosted and distributed is indicated by the symbols S_1TB and S_1WB. S_1TB indicates water processed through the treatment facility, pumped out, boosted and then distributed. S_1WB indicates water from local area wells boosted and distributed.

Table 129 shows the incremental costs of water delivered as described above. For S_1T water, the incremental cost of $141,03/mil gal includes acquisition from the river source, the treatment process, and the pumping of the water under pressure from the treatment facility. An additional $63.271 mil gal must be added for the portion of water boosted and then delivered to the area; thus, the incremental cost becomes $204.30 and $151.78/mil gal.

Added to the incremental cost are the distribution, interest, and support services costs. Calculation of the distribution cost is based on the assumption that these unit costs are constant throughout the system. Therefore, the total capital and operating costs for distribution are divided by the number of gallons of RPW in the year under consideration, yielding a figure of $63.33/mil gal. The same approach is taken for interest and support services. These costs added together yield the total unit cost ($/mil gal) for each area (Table 129). For example, the water delivered as S_1T costs a total of $401.02/mil gal. The total metered consumption in Table 129 reflects the total amount of water for which revenue was charged during the year of analysis, and the total cost represents the total amount of capital and operating money expended in that year. Figure 69 is a sample rate schedule for general metered service.

Once these calculations are made and the various cost zones are established, costs versus charges can be examined. Table 130 shows the charge for water to the 10 largest customers served by the Elizabethtown Water Company. By comparing each user's location with the cost allocation table, it is possible to identify the actual allocated costs of delivering water to a specific customer.

TABLE 129. ELIZABETHTOWN SERVICE AREA COST, CONSUMPTION AND REVENUE BY ZONE

Zone	Incremental costs ($/mil gal)	Distribution costs ($/mil gal)	Interest ($/mil gal)	Support services ($/mil gal)	Total cost ($/mil gal)	RPW (mil gal)	Revenue
S_1T	141.03	63.33	113.04	83.62	401.02	19,708.20	7,903,382.36
S_1W	88.51	63.33	113.04	83.62	348.50	5,608.46	1,954,548.31
S_1TB	204.60	63.33	113.04	83.62	464.59	7,768.10	3,608,981.58
S_1WB	151.78	63.33	113.04	83.62	411.77	2,216.60	912,729.38
SW_1T	180.69	63.33	113.04	83.62	440.68	1,231.27	542,596.06
SW_1W	133.03	63.33	113.04	83.62	393.02	391.51	153,871.26
SW_1TB	280.31	63.33	113.04	83.62	540.30	82.31	44,472.09
SW_1WB	232.65	63.33	113.04	83.62	492.64	26.13	12,872.68
S_2T	164.98	63.33	113.04	83.62	424.97	704.25	299,285.12
S_2W	189.02	63.33	113.04	83.62	449.01	6.41	2,878.15
S_2TB	239.29	63.33	113.04	83.62	499.28	477.93	238,620.89
S_2WB	263.33	63.33	113.04	83.62	523.32	4.83	2,527.64
S_3T	183.58	63.33	113.04	83.62	443.57	24.12	10,698.91
S_3W	291.09	63.33	113.04	83.62	551.08	3.97	2,187.79
S_3TB	915.36	63.33	113.04	83.62	1,175.35	1.80	2,115.63
S_3WB	1,022.89	63.33	113.04	83.62	1,282.86	0.29	372.03
Total	---	---	---	---	---	38,256.18	15,692,139.88

ED-1 SM-1

RATE SCHEDULE NO.-1
GENERAL METER SERVICE

CONSUMPTION CHARGES

For the first 5,000 Cu.Ft. in the Quarter
$7.10 per M Cu.Ft.

For the next 5,000 Cu.Ft. in the Quarter
$5.80 per M Cu.Ft.

For the next 90,000 Cu.Ft. in the Quarter
$4.82 per M Cu.Ft.

For all in excess of 100,000 Cu.Ft. in the Quarter
$4.19 per M Cu.Ft.

SUBJECT TO THE FOLLOWING MINIMUM CHARGES

Size of Meter	Charge per Quarter	Cu. Ft. Equivalent
5/8"	$ 10.85	1500
3/4"	16.80	2300
1"	26.35	3700
1-1/2"	52.70	7900
2"	68.40	10800
3"	137.25	25000
4"	232.45	44800
6"	412.85	82200
8"	646.80	135400
10"	794.05	170500
12"	1,167.85	259700

Western Division

RATE SCHEDULE NO. P.D.-1
GENERAL METER SERVICE

CONSUMPTION CHARGES:

For the first 5,000 Cu.Ft. in the Quarter
$6.74 per M Cu.Ft.

For the next 5,000 Cu.Ft. in the Quarter
$5.51 per M Cu.Ft.

For the next 90,000 Cu.Ft. in the Quarter
$4.58 per M Cu.Ft.

For all in excess of 100,000 Cu.Ft. in the Quarter
$3.98 per M Cu.Ft.

SUBJECT TO THE FOLLOWING MINIMUM CHARGES:

Size of Meter	Charge per Quarter	Cu. Ft. Equivalent
5/8"	$ 10.30	1500
3/4"	16.05	2300
1"	25.10	3700
1-1/2"	50.15	7900
2"	65.10	10800
3"	130.70	25100
4"	221.40	44900
6"	393.60	82500
8"	609.75	134200
10"	744.15	168000
12"	1,091.25	255200

Southern Division

RATE SCHEDULE NO. SD-1
GENERAL METERED SERVICE

WEST WINDSOR TOWNSHIP — PLAINSBORO TOWNSHIP

CONSUMPTION CHARGES:

For the first 5,000 Cu.Ft. in the Quarter
$6.06 per M Cu.Ft.

For the next 5,000 Cu.Ft. in the Quarter
$4.84 per M Cu.Ft.

For the next 90,000 Cu.Ft. in the Quarter
$4.35 per M Cu.Ft.

For all in excess of 100,000 Cu.Ft. in the Quarter
$4.13 per M Cu.Ft.

SUBJECT TO THE FOLLOWING MINIMUM CHARGES

Size of Meter	Charge per Quarter	Cu. Ft. Equivalent
5/8"	$ 10.85	1700
3/4"	16.15	2600
1"	25.40	4100
1-1/2"	50.25	9100
2"	65.55	12500
3"	132.90	28000
4"	224.90	49100
6"	400.45	89500
8"	619.70	142000
10"	756.55	175100
12"	1,109.40	260600

RATE SCHEDULE SDP-1
GENERAL METERED SERVICE

CONSUMPTION CHARGES:

For the first 5,000 Cu.Ft. in the Quarter
$6.06 per M Cu.Ft.

For the next 5,000 Cu.Ft. in the Quarter
$4.84 per M Cu.Ft.

For the next 90,000 Cu.Ft. in the Quarter
$4.35 per M Cu.Ft.

For the next 100,000 Cu.Ft. in the Quarter
$4.13 per M Cu.Ft.

MINIMUM CHARGES:

Size of Meter	Charge per Quarter	Cu. Ft. Equivalent
5/8"	$ 8.00	1300
3/4"	9.30	1500
1"	13.10	2100
1-1/2"	30.05	4900
2"	37.50	6400
3"	86.15	17200
4"	125.05	26200
6"	234.80	51400
8"	332.65	73900

Figure 69. Elizabethtown Water Company meter rates.

TABLE 130. ELIZABETHTOWN WATER COMPANY WATER COSTS FOR 10 MAJOR USERS

Major user	High or low month	Units used (mil gal)	Amount billed	Unit charge ($/mil gal)	Cost zone
Newark, City	High	403.6	$73,053	$181.00	S_1TB
	Low	160.1	28,972	180.96	
Commonwealth Water Co.	High	275.9	58,215	211.00	S_1TB
	Low	243.3	51,331	210.98	
Elizabeth, City	High	226.7	47,842	211.04	S_1TB
	Low	163.3	34,451	210.97	
Edison, Township	High	168.0	35,376	210.57	S_1T
	Low	124.2	28,534	229.74	
Middlesex Water Co.	High	125.0	26,408	211.26	S_1T
	Low	113.5	24,079	212.15	
Public Service	High	124.2	36,960	297.58	S_1TB
	Low	71.3	26,165	366.97	
Franklin, Township	High	103.2	21,765	210.90	S_1T
	Low	67.1	14,151	210.89	
Bound Brook Water Co,	High	70.5	14,875	210.99	S_1T
	Low	51.2	10,799	210.92	
Exxon	High	78.5	24,246	308.87	S_1TB
	Low	38.8	13,210	340.46	
Highland Park, Borough	High	62.7	13,232	211.04	S_1T
	Low	48.1	10,342	215.01	

The Elizabethtown water service area is shown in Figure 70 with the top 10 customers identified. Though it is not possible to identify the specific zones, it is easy to see that most of the top customers (the cities of Newark and Elizabeth and several of the water companies) lie outside the normal distribution area, and for that reason are assumed to receive boosted water. It should be noted (Table 129) that the lowest total cost for boosted water is for S_1WB, which totals $411.77 (actual cost/mil gal) to deliver to that point.

The average unit costs for all water supplied during the most recent year studied are as follows:

	$/mil gal
Support services	89
Acquisition	67
Treatment	33
Distribution	144
Interest	113
Taxes	76
Total	492

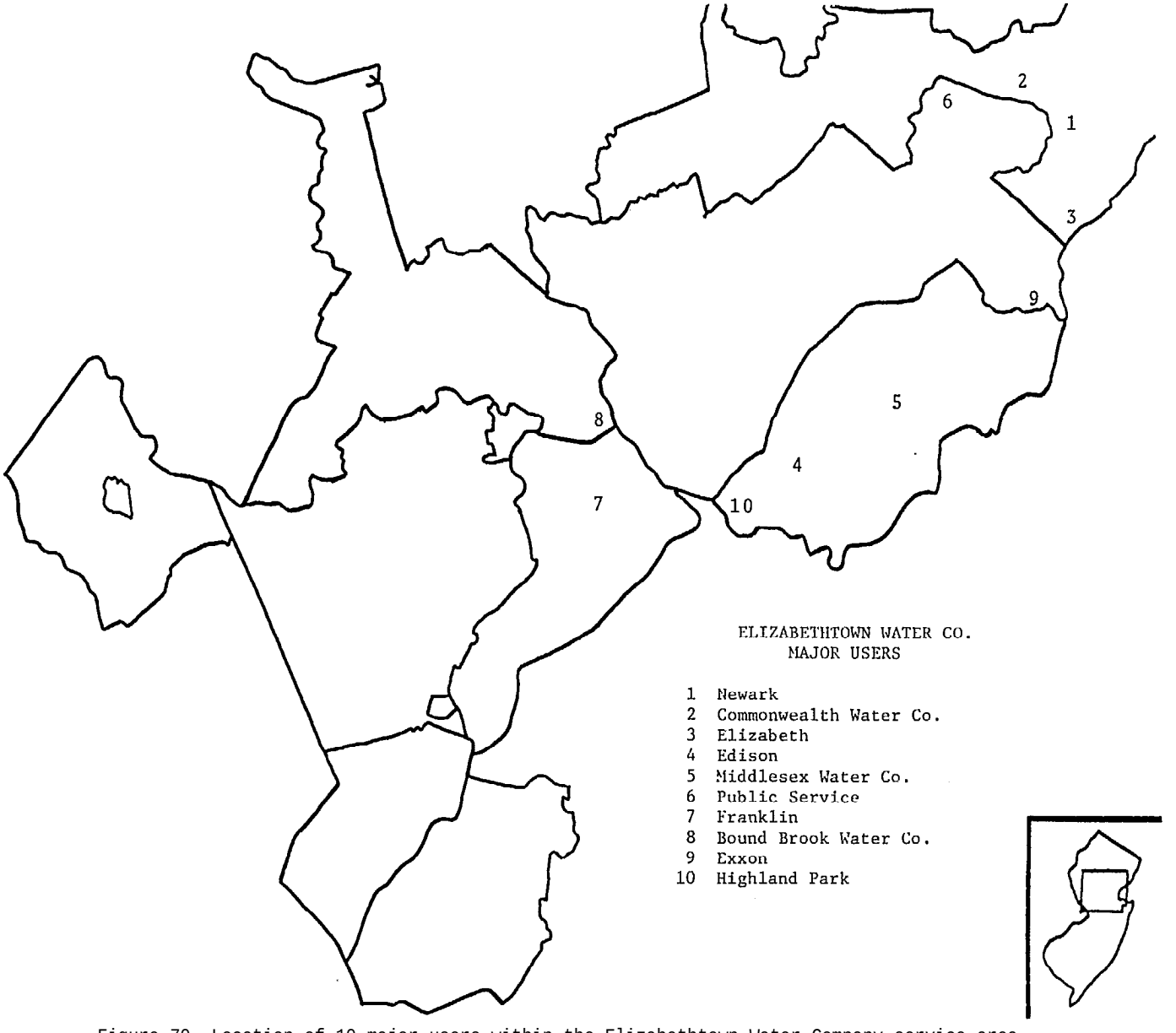

Figure 70. Location of 10 major users within the Elizabethtown Water Company service area.